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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
BROCK II, PAUL E	

ART UNIT	PAPER NUMBER
2815	

DATE MAILED: 02/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/067,424	LU ET AL.	
	Examiner	Art Unit	
	Paul E. Brock II	2815	

-- The MAILING DATE of this communication appears on th cov r sh t with the corr spondenc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 December 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *7-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 7 – 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art (AAPA) in view of Ishaque et al. (USPAT 5288989, Ishaque) and Possin et al. (USPAT 5777355, Possin).

With regard to claim 7, the AAPA discloses in figure 2 a method for making a high fill factor image array (40). The AAPA discloses in figure 2 providing a plurality of source-drain metal contacts (44) on a substrate (42). The AAPA discloses in figure 2 depositing a first passivation layer (first three quarters of the thickness of 56 deposited on 42) over the plurality of source-drain metal contacts and the substrate. The AAPA discloses on page 2, lines 19 – 20 that a preferred material for the first passivation layer is silicon oxynitride. The AAPA also discloses on page 3, lines 11 – 18 that an interface with the silicon oxynitride and an overlying layer causes conducting channels to occur between two lateral pixel electrodes. The AAPA further discloses on page 3, lines 19 – 21 a material different than silicon oxy-nitride as a first passivation layer is advantageous to prevent the conducting channels from forming between two pixel electrodes. The AAPA does not discuss using a particular different passivation layer.

Ishaque teaches in figure 1 depositing a passivation layer that comprises depositing a first passivation layer (132) over underlying devices and depositing a second passivation layer (134) that suppresses lateral leakage current over the first passivation layer. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the passivation layer of Ishaque in the method of the AAPA in order to use a passivation layer that reduces capacitive coupling between device structures as is known in the art, and provides a moisture barrier to the improved passivation layer as taught by Ishaque in column 7, lines 21 - 42. Further, any processing occurring after the deposition of the first passivation layer in the AAPA will now occur after the deposition of the first and second passivation layers of Ishaque. It should be noted that the limitation of "that suppresses lateral leakage current" is an intended use recitation that bears no patentable weight in a method claim. The AAPA discloses in figure 2 (taken together with the teaching of Ishaque) opening a plurality of via holes through the first and second passivation layers to the plurality of source-drain metal contacts. The AAPA discloses in figure 2 (taken together with the teaching of Ishaque) depositing a layer of conductive material (layer above arrow pointing out 46) over the plurality of source-drain metal contacts and the second passivation layer. The AAPA discloses in figure 2 depositing a first doped a-Si layer (48) over the layer of conductive material. The AAPA discloses in figure 2 patterning the first doped a-Si layer and the layer of conductive material to form the collection electrodes (46). The AAPA discloses in figure 2 (taken together with the teaching of Ishaque) depositing a continuous layer of i a-Si (50) disposed on the second passivation layer and the first doped a-Si layer. The AAPA discloses in figure 2 depositing a continuous second layer of doped a-Si (52) over the continuous layer of i a-Si. The AAPA discloses in figure 2 depositing an

upper conductive layer (54) over the second layer of doped a-Si. It is not clear if the AAPA and Ishaque teach patterning the upper conductive layer to form the image array. Possin teaches in figures 1 and 2; and in the abstract depositing and patterning an upper conductive layer (28). It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the patterning step of Possin in the method of the AAPA and Ishaque in order to differentiate the device into a plurality of devices, thus creating an array, which results in cost savings over having to make a plurality of devices separately. It would have been further obvious in the method of the AAPA in view of Ishaque and Possin that the patterning would form an image array.

With regard to claim 11, the AAPA discloses in figure 2 a high fill factor image array (40) forming process. The AAPA discloses in figure 2 providing a plurality of source-drain metal contacts (44) on a substrate. The AAPA discloses in figure 2 depositing a first passivation layer (first three quarters of the thickness of 56 deposited on 42) over the plurality of source-drain metal contacts and the substrate (42). The AAPA discloses on page 2, lines 19 – 20 that a preferred material for the first passivation layer is silicon oxynitride. The AAPA also discloses on page 3, lines 11 – 18 that an interface with the silicon oxynitride and an overlying layer causes conducting channels to occur between two lateral pixel electrodes. The AAPA further discloses on page 3, lines 19 – 21 a material different than silicon oxy-nitride as a first passivation layer is advantageous to prevent the conducting channels from forming between two pixel electrodes. The AAPA does not discuss using a particular different passivation layer. Ishaque teaches in figure 1 depositing a passivation layer that comprises depositing a first passivation layer (132) over underlying devices and depositing a second passivation layer (134)

that suppresses lateral leakage current over the first passivation layer. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the passivation layer of Ishaque in the method of the AAPA in order to use a passivation layer that reduces capacitive coupling between device structures as is known in the art, and provides a moisture barrier to the improved passivation layer as taught by Ishaque in column 7, lines 21 - 42. Further, any processing occurring after the deposition of the first passivation layer in the AAPA will now occur after the deposition of the first and second passivation layers of Ishaque. It should be noted that the limitation of "that suppresses lateral leakage current" is an intended use recitation that bears no patentable weight in a method claim. The AAPA discloses in figure 2 (taken together with the teaching of Ishaque) opening a plurality of via holes through the first and second passivation layers over the plurality of source-drain metal contacts. The AAPA discloses in figure 2 (taken together with the teaching of Ishaque) depositing a layer of conductive material (layer above arrow pointing out 46) on the plurality of source-drain metal contacts and over the second passivation layer. The AAPA discloses in figure 2 depositing a first doped a-Si layer (48) over the layer of conductive material. The AAPA discloses in figure 2 patterning the first doped a-Si layer and the layer of conductive material to form the collection electrodes (46). The AAPA discloses in figure 2 (taken together with the teaching of Ishaque) depositing a continuous layer of i a-Si (50) disposed on the second passivation layer and over the first doped a-Si layer. The AAPA discloses in figure 2 depositing a continuous second layer of doped a-Si (52) over the continuous layer of i a-Si. The AAPA discloses in figure 2 depositing an upper conductive layer (54) over the continuous second layer of doped a-Si. It is not clear if the AAPA and Ishaque teach patterning the upper conductive layer. Possin teaches in figures 1

and 2; and in the abstract depositing and patterning an upper conductive layer (28). It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the patterning step of Possin in the method of the AAPA and Ishaque in order to differentiate the device into a plurality of devices, thus creating an array, which results in cost savings over having to make a plurality of devices separately. It would have been further obvious in the method of the AAPA in view of Ishaque and Possin that the patterning would form an image array

With regard to claim 16, the AAPA discloses in figure 2 a method for making a high fill factor image array (40). The AAPA discloses in figure 2 providing a plurality of source-drain metal contacts (44). The AAPA discloses in figure 2 depositing a first passivation layer (first three quarters of the thickness of 56 deposited on 42) over the source-drain metal contact. The AAPA discloses on page 2, lines 19 – 20 that a preferred material for the first passivation layer is silicon oxy-nitride. The AAPA also discloses on page 3, lines 11 – 18 that an interface with the silicon oxy-nitride and an overlying layer causes conducting channels to occur between two lateral pixel electrodes. The AAPA further discloses on page 3, lines 19 – 21 a material different than silicon oxy-nitride as a first passivation layer is advantageous to prevent the conducting channels from forming between two pixel electrodes. The AAPA does not discuss using a particular different passivation layer. Ishaque teaches in figure 1 depositing a passivation layer that comprises depositing a first passivation layer (132) over underlying devices and depositing a second passivation layer (134) that suppresses lateral leakage current over the first passivation layer. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the passivation layer of Ishaque in the method of the AAPA in order to use a

passivation layer that reduces capacitive coupling between device structures as is known in the art, and provides a moisture barrier to the improved passivation layer as taught by Ishaque in column 7, lines 21 - 42. Further, any processing occurring after the deposition of the first passivation layer in the AAPA will now occur after the deposition of the first and second passivation layers of Ishaque. It should be noted that the limitation of "that suppresses lateral leakage current" is an intended use recitation that bears no patentable weight in a method claim. The AAPA discloses in figure 2 (taken together with the teaching of Ishaque) opening a via hole through the first and second passivation layers to expose the source-drain metal contact. The AAPA discloses in figure 2 depositing a layer of conductive material (46) on the source-drain metal contact, such that the layer of conductive material makes electrical contact with the source-drain metal contact. The AAPA discloses in figure 2 depositing a first doped a-Si layer (48) on the layer of conductive material. The AAPA discloses in figure 2 patterning the a-Si layer and the layer of conductive material to form a collection electrode (46). The AAPA discloses in figure 2 (taken together with the teaching of Ishaque) depositing sensor material comprising a continuous layer of i a-Si (50) over the collection electrode and at least a portion of the second passivation layer. The AAPA discloses in figure 2 depositing a continuous layer of doped a-Si (52) over the continuous layer of i a-Si. The AAPA discloses in figure 2 depositing a conductive layer (54) over the continuous layer of doped a-Si. The AAPA discloses in figure 2 that the conductive layer is an upper electrode. It is not clear if the AAPA teaches patterning the upper conductive layer to form the upper electrode. Possin teaches in figures 1 and 2; and in the abstract depositing and patterning a conductive layer (28) to form an upper electrode. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the

patterning step of Possin in the method of the AAPA in order to differentiate the device into a plurality of devices, thus creating an array, which results in cost savings over having to make a plurality of devices separately.

With regard to claims 8, 12, and 17, the Ishaque teaches in figure 1 and column 5, lines 15 – 29 wherein the first passivation layer comprises BCB.

With regard to claims 9, 13, and 18, Ishaque teaches in figure 1 and the abstract wherein the second passivation layer is an oxide.

With regard to claim 10, 14, and 19, Ishaque teaches in figure 1, column 5, lines 25 – 27 and 52 – 53 wherein the thickness of the second passivation layer is less than the thickness of the first passivation layer.

With regard to claim 15, Ishaque teaches in figure 1 and column 5, 52 – 53 wherein the second passivation layer has a thickness of about 1000 Å (i.e. the range of between about 400 Å and 1 micron encompasses the claimed range of about 1000 Å).

Response to Arguments

3. Applicant's arguments filed December 16, 2004 have been fully considered but they are not persuasive.

4. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on

combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In this case, applicant argues that neither the AAPA nor Ishaque teach depositing first and second passivation layers. It should be noted that Ishaque is relied upon this teaching and it is the combination of the AAPA with Ishaque that reads on the claimed invention. Therefore, applicant's arguments are not persuasive and the rejection is proper.

5. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In the case of the combination of AAPA with Ishaque, it should be noted that the motivation "in order to use a passivation layer that reduces capacitive coupling between device structures as is known in the art, and provides a moisture barrier to the improved passivation layer as taught by Ishaque in column 7, lines 21 – 42" has been provided. In the case of the combination of AAPA and Ishaque with Possin, it should be noted that the motivation "in order to differentiate the device into a plurality of devices, thus creating an array, which results in cost savings over having to make a plurality of devices separately." has been provided. Applicant does not explain why these motivations fail. Therefore applicant's arguments are not persuasive and the rejection is proper.

6. With regard to applicant's argument that "Ishaque teaches that an amorphous silicon layer can not be utilized as a photosensitive material because of the cure temperature required to drive moisture away during deposition and curing of the passivation layer that is utilized as the moisture barrier layer," it should be noted that the AAPA device is constructed in reverse order from Ishaque and would not suffer from the same defects to the amorphous layer as taught by Ishaque. Ishaque deposits the light sensitive material before depositing the polyimide and therefore must be concerned with the polyimide anneal temperature affects on any pre-deposited, light sensitive, amorphous silicon. However, the AAPA deposits the light sensitive amorphous silicon layers after any polyimide formation and anneal, and therefore would not suffer from the same affects which applicant contends are detrimental to the combination. One of ordinary skill would recognize that the combination would not suffer the same detrimental affects to amorphous silicon as taught by Ishaque because the amorphous silicon is deposited after any annealing in the combination. Thus, no amorphous silicon would be present while preparing the dual-layered dielectric in the combination. Therefore, applicant's arguments are not persuasive and the rejection is proper.

7. In response to applicant's argument that Ishaque is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, both the AAPA and Ishaque are

directed toward detecting electromagnetic radiation and are therefore analogous art. Therefore, applicant's arguments are not persuasive and the rejection is proper.

8. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). Therefore, applicant's arguments are not persuasive and the rejection is proper.

9. With regard to applicant's argument that "modification of Ishaque in the fashion suggested by the Examiner result in the invention of Ishaque becoming inoperable of its intended purpose, as taught in Ishaque itself," it should be noted that Ishaque is not being modified in the combination. The AAPA is being modified by Ishaque in the combination. Ishaque cannot be inoperable in the combination because it is the dual-layered dielectric of Ishaque that is used to as the dielectric in the combination with AAPA. Therefore, applicant's arguments are not persuasive and the rejection is proper.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul E. Brock II whose telephone number is (571) 272-1723. The examiner can normally be reached on 8:30 AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Paul E Brock II